

REMARKS/ARGUMENTS

Claims 1-51 are pending in this application, of which, claims 1, 38, and 51 are independent. Claims 1-51 stand rejected. In view of the remarks set forth below, Applicants respectfully submit that each of the pending claims is in condition for immediate allowance.

PTO-892

Applicants note that a PTO-892 has not been received listing U.S. Patent No. 5,174,649 (“Alston”). Applicants respectfully request that the Examiner provide a PTO-892 listing Alston.

Allowability of claims 1 and 38

Claims 1-7, and 29-33 stand rejected under 35 USC §103(a) as being unpatentable over U.S. Patent No. 5,174,649 (“Alston”) in view of U.S. Patent No. 6,406,172 (“Harbers”) and U.S. Patent No. 5,949,081 (“Ashley”). Applicants request withdrawal of this rejection.

Among the limitations of independent claims 1 and 38 not present in the cited references is a headlight element comprising at least one semiconductor chip, wherein “each of the semiconductor chips is integrated into the headlight without a housing.”

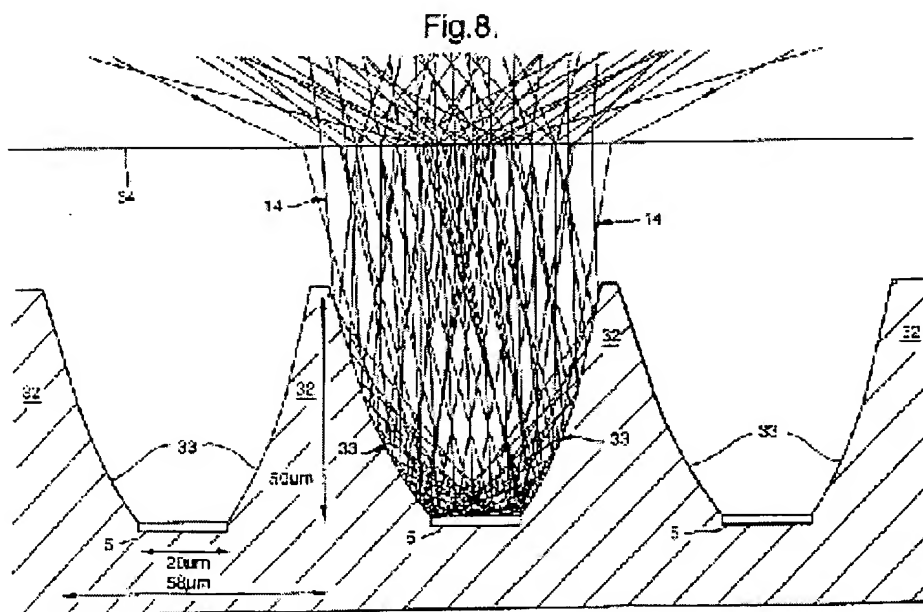
As recited in the claims, the semiconductor chip is integrated into the headlight without a housing. In contrast, the prior art references each disclose LED devices in housings. By integrating semiconductor devices without a housing into the headlight as in the claimed invention, the light input of the optical concentrator is closer to the LED element than it would be using an LED with a housing. Due to this proximity, a smaller optical concentrator can be used thereby yielding a higher light density when compared to a larger concentrator with a same divergence.

The Examiner asserts that Ashley teaches “wherein each of the semiconductor ships [sic] is integrated into the headlight without a housing [Figure 8: (5)].” (Office Action, p. 6 par. 18).

Applicants note that the Examiner's position is improper for at least two reasons. Ashley relates to infrared diodes, not a light emitting diode, and Ashley's diode is housed.

Ashley discloses an infrared scene projector for an infrared detection system (Ashley, Abstract). The disclosed infrared detection system has diodes 5 that emit infrared light. (Ashley, col. 1, ll. 62-64). A person skilled in the art would never turn to Ashley due to its teaching of an infrared LED. As light source for a headlamp, infrared light is clearly not suitable for illumination. Consequently, a person skilled in the art would not turn to Ashley for any reason.

Further, Ashley does not teach an LED chip without a housing. Figure 8 reproduced below, shows a diode 5 as an infrared radiation source. However, there is no disclosure in Ashley that diode 5 is a bare semiconductor chip integrated into the assembly without a housing. The term diode as used in Ashley can equally apply to a common housed infrared LED.



Even assuming *arguendo* that element 5 is a light emitting diode chip having a light output within the scope of the pending claims, which it is not, the diode 5 is clearly not a bare semiconductor ship without a housing. As shown in Figure 8 above, the diode 5 is situated at the

bottom of cone 32. The bottom and side faces of diode 5 are embedded in the material of the cone 32 and covered by material 34. “This surface 34a may be the surface of an antireflection coating 34 applied to the area of cones.” (Ashley, col. 5, ll. 19-21). The cones 32 being filled with the material 34 is evident from Figure 8 because the radiation 14 from infrared LEDs 5 is optically refracted when leaving the material 34. Thus, the material of cone 32 and material 34 house the diode 5.

Ashley does not disclose a semiconductor chip that is integrated into a headlight without a housing. Therefore, claims 1 and 8 are not rendered obvious by the combination of Ashley, Alston, and Harbers, whether taken alone or in combination.

Dependent claims 2-37 depend from and contain all of the limitations of claim 1. These dependent claims also recite additional limitations which, in combination with the limitations of claim 1 are neither disclosed nor suggested by the combination and are also directed toward patentable subject matter. Therefore, dependent claims 2-37 should also be allowed.

Dependent claims 39-50 depend from and contain all of the limitations of claim 38. These dependent claims also recite additional limitations which, in combination with the limitations of claim 38 are neither disclosed nor suggested by the combination and are also directed toward patentable subject matter. Therefore, dependent claims 39-50 should also be allowed.

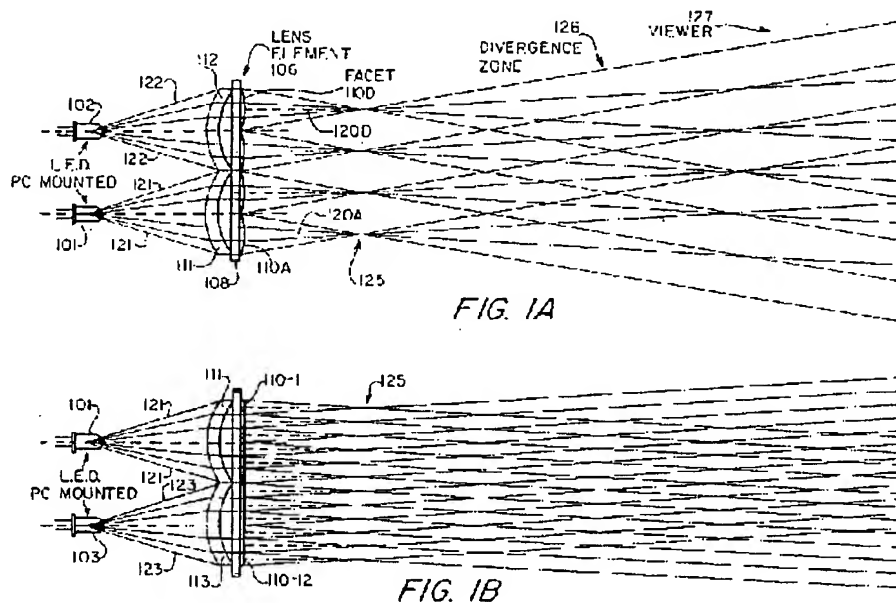
Allowability of claim 51

Claim 51, stands rejected under 35 U.S.C. §103(a) as unpatentable over Alston in view of Harbers. Applicants respectfully request reconsideration and withdrawal of this rejection.

Among the limitations of independent claim 51 not present in the cited combination is “the optical concentrator is a dielectric concentrator, whose base body is a solid body which is

composed of a dielectric material, the concentrator having side walls which connect the light input to the light output and are designed in such a way that direct connecting lines which run on the side walls run essentially in a straight line between the light input and the light output.”

The Examiner asserts that Alston discloses the above quoted feature of claim 51. Specifically, the Examiner cites element 106 in Figure 1A of Alston for the concentrator. For the Examiner’s convenience, Figures 1A and 1B of Alston are reproduced below. Applicants disagree with this interpretation of Alston's device.



Alston states the “lens element 106 includes a square body 108 which is seen from the edge in FIGS. 1A, 1B. Hyperboloid-section surfaces 111, 112, 113, 114 constitute the incident surfaces for light emitted by respective LED's 101, 102, 103, 104. The outer (exit) surface of the lens element 106 includes an array of facets provided in a row end column arrangement.” (Alston, col. 2, ll. 56-63). In other words, lens element 106, identified by the Examiner as the concentrator of pending claim 51, includes hyperboloid-section surfaces 111 to 114 as the light input and the facets 110 as the light output. The square body 108 is arranged between the hyperboloid-section surfaces and the facets of the lens.

As shown in Figure 1A and 1B above, lens element 106 is not a solid body. Further, as shown in Figure 1A there is no direct connecting line on the sidewalls of element 106, identified as the concentrator, which runs essentially in a straight line between the light input, for example element 112, to the light output, namely facet 110.

In Alston, a line connecting the light input and the light output of element 106 would be a curved line, since the square body 108, which is arranged between the light input and the light output, projects above elements 111 to 114 and the facets in the lateral direction. Thus, for at least these reasons, Alston does not disclose the concentrator as recited in pending claim 51. Therefore, the combination of Alston and Harbers does not render claim 51 unpatentable.

Conclusion

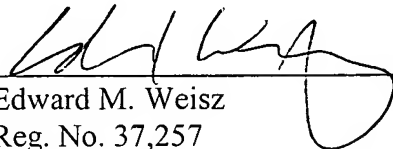
Claims 1-51 are allowable over the cited references, whether taken alone or in combination. As discussed above, the references fail to disclose at least the semiconductor chip integrated into the headlight without a housing or the concentrator as recited in the claims.

Applicants have responded to all of the rejections recited in the Office Action. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue.

If the Examiner believes an interview would be of assistance, the Examiner is encouraged to contact the undersigned at the number listed below.

It is believed that no additional fees or charges are required at this time in connection with the present application. However, if any fees or charges are required at this time, they may be charged to our Patent and Trademark Office Deposit Account No. 03-2412.

Respectfully submitted,
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